



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

p

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/709,284

04/27/2004

Takeshi Abe

81044232 / FMC 1636 PUS

3283

28395

7590

05/30/2006

BROOKS KUSHMAN P.C./FGTL  
1000 TOWN CENTER  
22ND FLOOR  
SOUTHFIELD, MI 48075-1238

EXAMINER

BINDA, GREGORY JOHN

ART UNIT

PAPER NUMBER

3679

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/709,284	Applicant(s) ABE ET AL.	
	Examiner Greg Binda	Art Unit 3679	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

Art Unit: 3679

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. The reply filed on April 19, 2006 is objected to because it fails to include a complete or accurate record of the substance of the March 15, 2006 interview. Such record must be provided in any reply to this Office action. If not provided, then the reply will be deemed not fully responsive.

*Specification*

3. The substitute specification filed April 19, 2006 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because the clean copy lacks all the changes shown in the marked-up copy.

4. The disclosure is objected to as failing to comply with 37 CFR 1.52(b)(2)(ii) for failing to be presented in font size 12.

5. The disclosure is objected to because in paragraphs 0031 & 0032 the term "2 pound" should be changed to "two pound".

6. A substitute specification excluding the claims is required pursuant to 37 CFR 1.125 because the original specification lacks pagination.

A substitute specification must not contain new matter. The substitute specification must be submitted with markings showing all the changes relative to the immediate prior version of the specification of record. The text of any added subject matter must be shown by underlining the added text. The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. **An accompanying clean version (without markings) and a statement that the substitute specification contains no new matter must also be supplied.** Numbering the paragraphs of the specification of record is not considered a change that must be shown.

7. The specification is objected to because the detailed description fails to provide proper antecedent basis for the following claimed subject matter:

- a. Claims 3, 4, 11-16 & 20: all limitations therein
- b. Claim 5: “the bending vibration antinode”
- c. Claim 8, line 3 and claim 17, line 3: “a central region”
- d. Claim 9: “a bending antinode”

#### *Claim Objections*

8. Claim 9 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 9 recites only that the inertia ring is fixed at the bending antinode nearest one end of the driveshaft. However, in claim 8 the

inertia ring is recited as being fixed at the point that separates the bending and breathing modes, a point that is necessarily (according to applicant's arguments in the amendment filed April 19, 2006) the bending antinode nearest one end of the driveshaft. See applicant's argument in regard to the 112(1) rejection of claim 8.

9. Claims 18-20 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to include all the of limitations of the claim on which they depend, claim 17. Claims 18-20 are directed only to the driveshaft connection of claim 17, not the entire drivetrain of claim 17. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form.

*Claim Rejections - 35 USC § 112*

10. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

a. Claim 1, lines 3 & 4 recites the limitation, "the rotating shaft . . . exhibits a bending mode and exhibits a breathing mode which are closely coupled". The specification fails to teach how to make such a shaft.

b. Claim 8, lines 4 & 5 and claim 17, lines 4 & 5 recite the limitation, "an inertia ring . . . fixed at a specified point on the driveshaft that separates the bending mode . . . from the breathing mode". The specification fails to teach how such a point is determined.

- c. Claim 13 recites the limitation, “the weight of the inertia ring is determined by finite element analysis” The specification fails to teach how such analysis is accomplished.
  - d. Claim 13 recites the limitation, “the weight of the inertia ring is determined by testing” The specification fails to teach how such testing is accomplished.
11. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. The term "closely" in claim 1, line 4 is a relative term which renders the claim indefinite. The term "closely" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.
- b. Claim 3 recites that the breathing mode is “the expansion and contraction of the shaft”. Thus begging the question – what else could it be, particularly in the other claims where it is not expressly recited as the expansion and contraction of the shaft.
- c. Claim 4 recites that the bending mode is “the oscillation of the shaft”. Thus begging the question – what else could it be, particularly in the other claims where is not expressly recited as the oscillation the shaft.

*Claim Rejections - 35 USC § 102*

12. Claims 1-5, 8, 9, 12, 13 & 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Larsen, US 3,037,573. Figs. 1-5 show a drivetrain for a vehicle (see col. 2, line 54) having an engine E, transmission (see col. 2, line 57), differential (see col. 2, line 58) and driveshaft

Art Unit: 3679

connection wherein the driveshaft connection comprises: a shaft 1 having first and second ends and a central region; and a rotationally symmetric inertia ring 13, 15, 17 having an inner opening fixed at a bending vibration antinode 16 near the end of the shaft (see also col. 3, line 74 through col. 4, line 4).

13. Claims 1-5, 8, 9, 12, 13 & 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Linn, US 1,776,125. Fig. 3 shows a drivetrain connection comprises: a shaft 3 having first and second ends and a central region; and a rotationally symmetric inertia ring 6 having an inner opening fixed at a bending vibration antinode near the end of the shaft.

*Claim Rejections - 35 USC § 103*

14. Claims 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linn. Linn shows all the limitations of the claimed invention, but does expressly disclose making the inertia ring from steel or aluminum. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the inertia ring from steel or aluminum, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

15. Claims 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsen for the same reasons noted immediately above.

Art Unit: 3679

16. Claims 6, 7, 10, 11, 19 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linn in view of Hornig et al, US 4,196,786 (Hornig). Linn shows a driveshaft comprising an inertia ring 6, but does expressly disclose the ring being made of two pressed clamped halves having an inner diameter that is less than the outer diameter of the shaft. Hornig shows a driveshaft comprising an inertia ring made of two pressed clamped halves 15 having an inner diameter (at the portions 18) that is less than the outer diameter of the shaft. In col. 2, lines 17-33, Hornig teaches making the inertia ring in this way in order to provide a simple, inexpensive and readily installed means for damping vibrations. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driveshaft of Linn by making the inertia ring from two pressed clamped halves having an inner diameter that is less than the outer diameter of the shaft in provide a simple, inexpensive and readily installed means for damping vibrations as taught by Hornig.

*Response to Arguments*

17. Applicant's arguments filed April 19, 2006. have been fully considered but they are not persuasive.

a. In regard to item 10a above, applicant argues that claims 1-7 are enabled because the specification parrots the offending limitation. However, parroting a limitation does not necessarily enable it. Unless, applicant provides persuasive evidence that shows that making a shaft so that its breathing and bending modes are closely coupled is within the knowledge of one of average skill in the art, the claimed invention is not enabled.



b. In regard to item 10b above, applicant argues that claims 8-16 are enabled because the specification describes placing the inertia weight at the antinode nearest an end of the shaft. If the specification taught that the only way to separate the bending mode from the breathing mode is by placing an inertia weight at the antinode nearest an end of the shaft, then perhaps the claims would be enabled. However, the specification never teaches such a requirement. In fact the specification very clearly teaches the opposite when, at paragraph 0013, it indicates that the inertia weight need only be fixed at an unspecified "specified point" to accomplish the disclosed invention.

c. In regard to item 10c & d above, applicant argues that claims 13 & 16 are enabled because one of average skill in the art would know the specific finite element analysis and testing applicant never specifies in the disclosure. However, applicant has not provided any evidence to support that argument.

d. In regard to item 10d above, applicant argues that claim 16 is enabled because Figs. 6 & 7 show the testing corresponding to that recited in the claim. However, no particular test or tests are shown or disclosed in the drawings.

e. In regard to item 11a above, applicant argues that claims 1-7 are definite because the drawings show how close a closely coupled relationship is. However, the drawings are not drawn to scale, nor is there any description in the disclosure that would inform one that the drawings show the degree of closeness that constitutes a closely coupled relationship.

f. In regard to item 11b above, applicant argues that claims 1, 2 & 4-7 are enabled because claim 3 "further defines the breathing mode". As such applicant's argument is

not only unpersuasive towards overturning the rejection, it actually supports the grounds for rejection. If claim 3 *further* defines the breathing mode, then what is the definition of the breathing mode in claims 1, 2 & 4-7?

g. In regard to item 11b above, applicant argues that claims 1-3 & 5-7 are enabled because claim 4 further defines the bending mode. As such applicant's argument is not only unpersuasive towards overturning the rejection, it actually supports the grounds for rejection. If claim 4 *further* defines the bending mode, then what is the definition of the bending mode in claims 1-3 & 5-7?

h. In regard to items 12 & 13 above, applicant argues that Larsen and Linn each fail to show a rotating shaft with closely coupled bending and breathing modes. However, applicant has not pointed out any structure in Larsen or Linn that precludes such close coupling. Nor has applicant pointed to any structure that provides such structure in the alleged invention. Instead, applicant simply states that the close coupling is inherent (see applicant's argument in regard to item 10a). If simply stating that close coupling is inherent is good enough for applicant, then it's good enough for the prior art.

i. In regard to items 12 & 13 above, applicant argues that Larsen and Linn each fail to show a rotating shaft with closely coupled bending and breathing modes because (according to his arguments in regard to item 10a) only a shaft having every structural feature illustrated in the instant drawings exhibits such close coupling. However, if there is some heretofore undescribed and unclaimed structure shown in the4 instant drawings that is necessary to the practice of the claimed invention, then that structure must be recited in the claims as well as be described and enabled in the specification. Although

the claims are interpreted in light of the disclosure, limitations from the disclosure (including the drawings) are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

j. In regard to item 12 above, applicant argues that Larsen fails to show the inertia ring at a specified point that decouples the bending and breathing modes. However, as noted in item 12, Larsen *expressly* discloses placing an inertia ring at an antinode nearest the end of the shaft which is precisely the “point” specified by applicant as providing decoupling of the bending and breathing modes.

k. In regard to item 13 above, applicant argues that Linn fails to show the inertia ring at a specified point that decouples the bending and breathing modes. However, in Fig. 3 Linn shows an inertia ring at an antinode nearest the end of the shaft which is precisely the “point” specified by applicant as providing decoupling of the bending and breathing modes.

l. In regard to items 14 & 15 above, applicant argues that claims 14 & 15 are patentable over each of Larsen and Linn because neither reference discloses operation below critical speed. The argument is unpersuasive. The claims are directed to a driveshaft with inertia weights made of particular materials, not a method of operating a shaft. The prior art need only show that the materials claimed were known to be used for inertia weights in shafts like those shown in Larsen and Linn, not any particular method of operating one. Since the prior art does disclose that aluminum and steel are known materials for inertia weights (see item 17 in the previous Office action), the claims are unpatentable over both Larsen and Linn.

m. In regard to item 16 above, applicant argues that claims 6, 7, 10, 11, 19 & 20 are patentable because neither Linn nor Hornig discloses operation below critical speed. The argument is unpersuasive. The claims are directed to a driveshaft, not a method of operating one. The prior art need only show that such a driveshaft is obvious, not a method of using one.

*Conclusion*

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Greg Binda whose telephone number is (571) 272-7077. The examiner can normally be reached on M-F 9:30 am to 7:00 pm with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on (571) 272-7087. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Greg Binda  
Primary Examiner  
Art Unit 3679